CPC COOPERATIVE PATENT CLASSIFICATION

G10K SOUND-PRODUCING DEVICES (sound-producing toys A63H 5/00 ; musical instruments or parts thereof, see the relevant subclass, e.g. G10D)

ACOUSTICS NOT OTHERWISE PROVIDED FOR (systems using the reflection or reradiation of acoustic waves G01S 15/00 ; generating seismic energy G01V 1/02 ; signalling or calling arrangements, alarm arrangements G08B ; piezo-electric electrostrictive or magnetostrictive elements in general H01L 41/00 ; transmission systems using infrasonic, sonic, or ultrasonic waves H04B 11/00 ; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers H04R)

NOTE

This subclass covers arrangements for generating mechanical vibrations in fluids.

This subclass covers also the production of sounds which may not be audible to human beings but which are audible to animals.

In this subclass, the following terms are used with the meanings indicated:

- "acoustics" and "sound" cover the technical field dealing with mechanical vibrations at all infrasonic -, sonic - and ultrasonic frequencies. However, generation or transmission of mechanical waves, in general, is covered by subclass B06B , subject to the exception specified in Note (1) above.

Guide heading:

G10K 1/00 Devices in which sound is produced by striking a resonating body, e.g. bell, chimes, gong (combinations with clocks or watches G04B , G04C ; carillons G10F 1/10 ; { for percussion instruments G10D 13/00 })

G10K 1/06 . the resonating devices having the shape of a bell, plate, rod, or tube (bells for towers G10K 1/28)

G10K 1/062 . . electrically operated { self-interrupting relays H01H 51/34 }

G10K 1/063 . . . the sounding member being a bell

G10K 1/064 . . . . Operating or striking mechanisms therefor

G10K 1/0645 . . . . . { provided with loudness adjustment }

G10K 1/065 . . . . . for timed or repeated operation { alarm-clocks G04C 21/00 }

G10K 1/066 . . . the sounding member being a tube, plate or rod

G10K 1/067 . . . . Operating or striking mechanisms therefor

G10K 1/068 . . hydraulically operated
pneumatically operated

G10K 1/07 . . mechanically operated
Hand bells
Bells for animals

G10K 1/071 . . . Hand bells

Bells for animals

G10K 1/072 . . . Operating or striking mechanisms therefor

G10K 1/074 . . . . with rotary clappers or shells

G10K 1/076 . . . . for timed or repeated operation { alarm-clocks G04B 23/00 }

G10K 1/08 . . Details or accessories of general applicability

G10K 1/10 . . . Sounding members
Mounting thereof
Clappers or other strikers

G10K 1/26 . . . Mountings
Casings

G10K 1/28 . Bells for towers or the like

G10K 1/30 . . Details or accessories

G10K 1/32 . . . Sounding members
Clappers or other strikers

G10K 1/34 . . . Operating mechanisms

G10K 1/341 . . . . { for a still-standing bell }

G10K 1/342 . . . . . { electrically operated }

G10K 1/344 . . . . { for an oscillating bell which is driven once per cycle }

G10K 1/345 . . . . . { electrically operated }

G10K 1/347 . . . . { for an oscillating bell which is driven twice per cycle }

G10K 1/348 . . . . . { electrically operated }

G10K 1/36 . . . Means for silencing or damping (means or arrangements for avoiding or reducing out-of-balance forces due to motion F16F 15/00)

G10K 1/38 . . . Supports
Mountings

G10K 3/00 **Rattles or like noise-producing devices,** { e.g. door-knockers }

G10K 5/00 **Whistles**

G10K 5/02 . Ultrasonic whistles

G10K 7/00 **Sirens**

G10K 7/005 . { Ultrasonic sirens }

G10K 7/02 . in which the sound-producing member is rotated manually or by a motor (G10K 7/06 takes precedence; { musical tops A63H 1/28 })

G10K 7/04 . . by an electric motor

G10K 7/06 . in which the sound-producing member is driven by a fluid, e.g. by a compressed gas { (fluidically operated vibrators B06B 1/18) }

G10K 9/00 **Devices in which sound is produced by vibrating a diaphragm or analogous**

element, e.g. fog horn, vehicle hooter, buzzer (loudspeakers or like acoustic electromechanical transducers H04R) { arrangement or adaptation for ships B63B 45/08 ; mechanically driven vibrators B06B 1/10 }

G10K 9/02 . driven by gas
e.g. suction operated

G10K 9/04 . . by compressed gases, e.g. compressed air

G10K 9/06 . . produced by detonation

G10K 9/08 . driven by water or other liquids

G10K 9/10 . driven by mechanical means only

G10K 9/12 . electrically operated

NOTE

This group does not cover the construction of, or circuits for, broadband-transducers such as loudspeakers or microphones, which are covered by subclass H04R .

G10K 9/121 . . { Flextensional transducers }

G10K 9/122 . . using piezo-electric driving means { (G10K 9/121 takes precedence) }

G10K 9/125 . . . with a plurality of active elements

G10K 9/128 . . using magnetostrictive driving means { (G10K 9/121 takes precedence) }

G10K 9/13 . . using electromagnetic driving means

NOTE

see provisionally also G10K 9/12

G10K 9/15 . . . Self-interrupting arrangements

G10K 9/16 . . with means for generating current by muscle power

G10K 9/18 . Details, e.g. bulb, pump, piston, switch, casing { cones, diaphragms G10K 13/00 }

G10K 9/20 . . Sounding members

G10K 9/22 . . Mountings
Casings

G10K 11/00 **Methods or devices for transmitting, conducting or directing sound in general Methods or devices for protecting against, or for damping, noise or other acoustic waves in general** ({ protective devices for the ears A61F 11/06 } ; sound insulation for vehicles B60R 13/08 ; sound insulation for aircraft B64C 1/40 ; sound insulating materials, see the relevant places, e.g. C04B 26/00 to C04B 38/00 ; reduction of noise on permanent way E01B 19/00 ; absorption of air-transmitted noise from road or railway traffic E01F 8/00 ; noise insulation, absorption or reflection in buildings E04B 1/74 ; room acoustics E04B 1/99 ; sound insulation in floors E04F 15/20 ; gas-flow silencers or exhaust apparatus for machines or engines in general, for internal-combustion engines F01N ; intake silencers for internal-combustion engines F02M 35/00 ; suppression of undesired vibrations F16F 7/00 to G10K 15/00 ; preventing noise in valves F16K 47/02 ;

noise absorbers in pipes F16L 55/02 ; arrangements for suppressing noise in direct-contact trickle coolers F28C 1/10 ; silencers for weapons F41)

G10K 11/002 . { Devices for damping, suppressing, obstructing or conducting sound in acoustic devices (G10K 1/06 to G10K 1/10 take precedence; for electro-mechanical transducers for communication H04R 3/002) }

G10K 11/004 . { Mounting transducers e.g. provided with mechanical moving or orienting device (mountings specially adapted to a particular sound-producing device, see the preceding groups G10K 1/00 to G10K 9/00 , e.g. G10K 1/26 , G10K 1/28 , G10K 9/22 ; arrangements of sonic watch equipment on submarines B63G 8/39 ; buoys B63B 22/00) }

G10K 11/006 . . { Transducer mounting in underwater equipment, e.g. sonobuoys }

G10K 11/008 . . . { Arrays of transducers (seismic streamers, see G01V 1/20) }

G10K 11/02 . Mechanical acoustic impedances
Impedance matching, e.g. by horns
Acoustic resonators

G10K 11/025 . . { horns for impedance matching (see provisionally also G10K 11/28) }

G10K 11/04 . . Acoustic filters { ; Acoustic resonators }

G10K 11/08 . Non-electric sound-amplifying devices, e.g. non-electric megaphones (amplifying by horns G10K 11/02 ; amplifying by focusing G10K 11/26)

G10K 11/16 . Methods or devices for protecting against, or damping of, acoustic waves, e.g. sound (G10K 11/36 takes precedence)

NOTE

This group does not cover protecting against, or damping of, acoustic waves adapted for particular applications, which are covered by the subclasses for these applications, provided that there is a specific provision for this aspect.

G10K 11/161 . . { in systems with fluid flow (G10K 11/16B takes precedence; gas flow silencers or exhaust apparatus for machines or engines in general or for internal combustion engine F01N , noise absorbers in pipes or pipe systems F16L 55/02 ; noise absorption in air conditioning and ventilation F24F 13/00C ; silencing exhaust or propulsion jets in aircraft B64D 33/06) }

G10K 11/162 . . Selection of materials

G10K 11/165 . . . Particles in a matrix

G10K 11/168 . . . Plural layers of different materials, e.g. sandwiches

NOTE

When classifying in this group, classification is also made in subclass B32B , in so far as any layered product is concerned.

G10K 11/172 . . . using resonance effects

G10K 11/175 . . using interference effects
Masking sound

G10K 11/178 . . . by electro-acoustically regenerating the original acoustic waves in anti-phase

G10K 11/1782 . . . . { using single input }
G10K 11/1784 . . . . { using multiple inputs; single output }
G10K 11/1786 . . . . { using multiple inputs; multiple outputs }
G10K 11/1788 . . . . { Structural details }

G10K 11/18 . Methods or devices for transmitting, conducting, or directing sound (G10K 11/02 , G10K 11/36 take precedence; medical stethoscopes A61B 7/02)
G10K 11/20 . . Reflecting arrangements (G10K 11/28 takes precedence)
G10K 11/205 . . . { for underwater use }
G10K 11/22 . . for conducting sound through hollow pipes, e.g. speaking tubes
G10K 11/24 . . for conducting sound through solid bodies, e.g. wire
G10K 11/26 . . Sound-focusing or directing, e.g. scanning { horns for impedance matching G10K 11/02 ; megaphones G10K 11/08 }
G10K 11/28 . . . using reflection, e.g. parabolic reflector { (hearing aids A61F 11/008) }
G10K 11/30 . . . using refraction, e.g. acoustic lenses
G10K 11/32 . . . characterised by the shape of the source
G10K 11/34 . . . using electrical steering of transducer arrays, e.g. beam steering { (constructional aspects B06B 1/0607 , B06B 1/085) }
G10K 11/341 . . . . { Circuits therefor }
G10K 11/343 . . . . . { using frequency variation or different frequencies }
G10K 11/345 . . . . . { using energy switching from one active element to another }
G10K 11/346 . . . . . { using phase variation }
G10K 11/348 . . . . . { using amplitude variation }
G10K 11/35 . . . using mechanical steering of transducers { or their beams }
G10K 11/352 . . . . { by moving the transducer }
G10K 11/355 . . . . . { Arcuate movement }
G10K 11/357 . . . . { by moving a reflector }

G10K 11/36 . Devices for manipulating acoustic surface waves (electro-acoustic amplifiers H03F 13/00 ; networks comprising electro-acoustic elements H03H 9/00)

G10K 13/00 **Cones, diaphragms, or the like, for emitting or receiving sound in general** (for electromechanical transducers H04R 7/00)

G10K 15/00 **Acoustics not otherwise provided for**

G10K 15/02 . Synthesis of acoustic waves (synthesis of speech G10L)

NOTE

see provisionally G10H e.g. G10H 1/26

G10K 15/04 . Sound-producing devices (G10K 15/02 takes precedence)
G10K 15/043 . . { producing shock waves (G10K 15/046 , G10K 15/06 take precedence; generating seismic energy G01V 1/02) }

G10K 15/046 . . { using optical excitation, e.g. laser bundle }
G10K 15/06 . . using electric discharge

G10K 15/08 . Arrangements for producing a reverberation or echo sound { modifying acoustic properties to change reverberation time G10K 11/002 }
G10K 15/10 . . using time-delay networks comprising electromechanical or electro-acoustic devices
G10K 15/12 . . using electronic time-delay networks

Guide heading:

G10K 2200/00

G10K 2200/10 . Beamforming, e.g. time reversal, phase conjugation or similar

G10K 2200/11 . Underwater, e.g. transducers for generating acoustic waves underwater

Guide heading:

G10K 2210/00 **Details of active noise control [ANC] covered by G10K 11/178 but not provided for in any of its subgroups**

G10K 2210/10 . Applications
G10K 2210/101 . . One dimensional
G10K 2210/102 . . Two dimensional
G10K 2210/103 . . Three dimensional
G10K 2210/104 . . Aircos
G10K 2210/105 . . Appliances, e.g. washing machines or dishwashers
G10K 2210/1051 . . . Camcorder
G10K 2210/1052 . . . Copiers or other image-forming apparatus, e.g. laser printer
G10K 2210/1053 . . . Hi-fi, i.e. anything involving music, radios or loudspeakers
G10K 2210/1054 . . . Refrigerators
G10K 2210/106 . . Boxes, i.e. active box covering a noise source
Enclosures
G10K 2210/107 . . Combustion, e.g. burner noise control of jet engines (internal combustion engines G10K 2210/121)
G10K 2210/108 . . Communication systems, e.g. where useful sound is kept and noise is cancelled
G10K 2210/1081 . . . Earphones, e.g. for telephones, ear protectors or headsets
G10K 2210/1082 . . . Microphones, e.g. systems using "virtual" microphones
G10K 2210/109 . . Compressors, e.g. fans
G10K 2210/11 . . Computers, i.e. ANC of the noise created by cooling fan, hard drive or the like
G10K 2210/111 . . Directivity control or beam pattern
G10K 2210/112 . . Ducts (vehicle exhausts G10K 2210/12822)
G10K 2210/113 . . Elevators

G10K 2210/114	. .	Feeders, i.e. of the vibrating kind
G10K 2210/115	. .	Impact noise, e.g. from typewriter or printer
G10K 2210/116	. .	Medical Dental
G10K 2210/1161	. . .	NMR or MRI
G10K 2210/117	. .	Nonlinear
G10K 2210/118	. .	Panels, e.g. active sound-absorption panels or noise barriers
G10K 2210/119	. .	Radiation control, e.g. control of sound radiated by vibrating structures
G10K 2210/12	. .	Rooms, e.g. ANC inside a room, office, concert hall or automobile cabin
G10K 2210/121	. .	Rotating machines, e.g. engines, turbines, motors Periodic or quasi-periodic signals in general
G10K 2210/122	. .	Seismics
G10K 2210/123	. .	Synchrophasors or other applications where multiple noise sources are driven with a particular phase relationship
G10K 2210/124	. .	Traffic
G10K 2210/125	. .	Transformers
G10K 2210/126	. .	Transients
G10K 2210/127	. .	Underwater acoustics, e.g. for submarine
G10K 2210/128	. .	Vehicles
G10K 2210/1281	. . .	Aircraft, e.g. spacecraft, airplane or helicopter
G10K 2210/1282	. . .	Automobiles
G10K 2210/12821	. . . .	Rolling noise Wind and body noise
G10K 2210/12822	. . . .	Exhaust pipes or mufflers
G10K 2210/1283	. . .	Trains, trams or the like
G10K 2210/129	. .	Vibration, e.g. instead of, or in addition to, acoustic noise
G10K 2210/1291	. . .	Anti-Vibration-Control, e.g. reducing vibrations in panels or beams
G10K 2210/30	.	Means
G10K 2210/301	. .	Computational
G10K 2210/3011	. . .	Single acoustic input
G10K 2210/3012	. . .	Algorithms
G10K 2210/3013	. . .	Analogue, i.e. using analogue computers or circuits
G10K 2210/3014	. . .	Adaptive noise equalizers [ANE], i.e. where part of the unwanted sound is retained
G10K 2210/3015	. . .	Averaging, e.g. exponential
G10K 2210/3016	. . .	Control strategies, e.g. energy minimization or intensity measurements
G10K 2210/3017	. . .	Copy, i.e. whereby an estimated transfer function in one functional block is copied to another block
G10K 2210/3018	. . .	Correlators, e.g. convolvers or coherence calculators
G10K 2210/3019	. . .	Cross-terms between multiple in's and out's
G10K 2210/3021	. . .	Eigenfrequencies Eigenvalues, e.g. used to identify most significant couplings between actuators and sensors

G10K 2210/3022	. . .	Error paths
G10K 2210/3023	. . .	Estimation of noise, e.g. on error signals
G10K 2210/30231	. . . .	Sources, e.g. identifying noisy processes or components
G10K 2210/30232	. . . .	Transfer functions, e.g. impulse response
G10K 2210/3024	. . .	Expert systems, e.g. artificial intelligence
G10K 2210/3025	. . .	Determination of spectrum characteristics, e.g. FFT
G10K 2210/3026	. . .	Feedback
G10K 2210/3027	. . .	Feedforward
G10K 2210/3028	. . .	Filtering, e.g. Kalman filters or special analogue or digital filters
G10K 2210/30281	. . . .	Lattice filters
G10K 2210/3029	. . .	Fuzzy logic Genetic algorithms
G10K 2210/3031	. . .	Hardware, e.g. architecture
G10K 2210/3032	. . .	Harmonics or sub-harmonics
G10K 2210/3033	. . .	Information contained in memory, e.g. stored signals or transfer functions
G10K 2210/3034	. . .	Integrators
G10K 2210/3035	. . .	Models, e.g. of the acoustic system
G10K 2210/30351	. . . .	Identification of the environment for applying appropriate model characteristics
G10K 2210/3036	. . .	Modes, e.g. vibrational or spatial modes
G10K 2210/3037	. . .	Monitoring various blocks in the flow chart
G10K 2210/3038	. . .	Neural networks
G10K 2210/3039	. . .	Nonlinear, e.g. clipping, numerical truncation, thresholding or variable input and output gain
G10K 2210/30391	. . . .	Resetting of the filter parameters or changing the algorithm according to prevailing conditions
G10K 2210/3041	. . .	Offline
G10K 2210/3042	. . .	Parallel processing
G10K 2210/3043	. . .	Phase locked loops [PLL]
G10K 2210/3044	. . .	Phase shift, e.g. complex envelope processing
G10K 2210/3045	. . .	Multiple acoustic inputs, single acoustic output
G10K 2210/3046	. . .	Multiple acoustic inputs, multiple acoustic outputs
G10K 2210/3047	. . .	Prediction, e.g. of future values of noise
G10K 2210/3048	. . .	Pretraining, e.g. to identify transfer functions
G10K 2210/3049	. . .	Random noise used e.g. in model identification
G10K 2210/3051	. . .	Sampling, e.g. variable rate, synchronous, decimated or interpolated
G10K 2210/3052	. . .	Simulation
G10K 2210/3053	. . .	Speeding up computation or convergence, or decreasing the computational load
G10K 2210/3054	. . .	Stepsize variation
G10K 2210/3055	. . .	Transfer function of the acoustic system
G10K 2210/3056	. . .	Variable gain
G10K 2210/3057	. . .	Variation of parameters to test for optimisation

G10K 2210/321	..	Physical
G10K 2210/3211	...	Active mounts for vibrating structures with means to actively suppress the vibration, e.g. for vehicles
G10K 2210/3212	...	Actuator details, e.g. composition or microstructure
G10K 2210/32121	....	Fluid amplifiers, e.g. modulated gas flow speaker using electrovalves
G10K 2210/3213	...	Automatic gain control [AGC]
G10K 2210/3214	...	Architectures, e.g. special constructional features or arrangements of features
G10K 2210/3215	...	Arrays, e.g. for beamforming
G10K 2210/3216	...	Cancellation means disposed in the vicinity of the source
G10K 2210/3217	...	Collocated sensor and cancelling actuator, e.g. "virtual earth" designs
G10K 2210/3218	...	Filters other than the algorithm-related filters
G10K 2210/3219	...	Geometry of the configuration
G10K 2210/3221	...	Headrests, seats or the like, for personal ANC systems
G10K 2210/3222	...	Manual tuning
G10K 2210/3223	...	Materials, e.g. special compositions or gases
G10K 2210/3224	...	Passive absorbers
G10K 2210/3225	...	Radio or other sources used in ANC for transfer function estimation Means to avoid interference between desired signals, e.g. from a car stereo, and the ANC signal
G10K 2210/3226	...	Sensor details, e.g. for producing a reference or error signal
G10K 2210/3227	...	Resonators
G10K 2210/32271	....	Active resonators
G10K 2210/32272	....	Helmholtz resonators
G10K 2210/3228	...	Shunts
G10K 2210/3229	...	Transducers
G10K 2210/32291	....	Plates or thin films, e.g PVDF (foil-type piezo-electric elements B06B 1/0688)
G10K 2210/50	.	Miscellaneous
G10K 2210/501	..	Acceleration, e.g. for accelerometers
G10K 2210/502	..	Ageing, e.g. of the control system
G10K 2210/503	..	Diagnostics Stability Alarms Failsafe
G10K 2210/504	..	Calibration
G10K 2210/505	..	Echo cancellation, e.g. multipath-, ghost- or reverberation-cancellation
G10K 2210/506	..	Feedback, e.g. howling
G10K 2210/507	..	Flow or turbulence
G10K 2210/508	..	Reviews on ANC in general, e.g. literature
G10K 2210/509	..	Hybrid, i.e. combining different technologies, e.g. passive and active
G10K 2210/51	..	Improving tonal quality, e.g. mimicking sports cars
G10K 2210/511	..	Narrow band, e.g. implementations for single frequency cancellation
G10K 2210/512	..	Wide band, e.g. non-recurring signals